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The RPC in the cosmic ray physics of the next future

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The RPCs are widely employed in accelerator particle physics. Conversely, concerning cosmic ray physics, Argo was the only ground-based experiment which used this detector in a very extensive way. The brilliant results published by this experiment encourage to propose RPCs for further experiments. Indeed, they have the advantage of efficiently detecting very low energy secondaries and of imaging the front of an extensive air shower with an unprecedented detail. This makes them particularly attractive for the detection of very low energy showers. Moreover, the RPCs can be easily hybridized with water Cherenkov detectors, thus combining the advantages of both detectors.

Optimizing RPCs for cosmic ray physics requires however to substantially reconsider their optimal characteristics with respect to the case of accelerator experiments. The required parameters indeed are the construction simplicity, the working reliability in hostile environment and the low cost, rather than a very high time resolution and rate capability.

This talk will show an example of RPC based detector conceived for gamma ray astronomy and cosmic ray physics together with a chamber set up particularly suitable for this detector

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